"Friending" the National Parks: Where Nonprofits Help to Conserve Public Resources

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Abstract

Ostrom's Social-Ecological Systems (SES) framework has infrequently been applied to civil society research. But its focus on collective action may help explain why some national parks are more successful at attracting philanthropic resources to supplement stagnant public funding. We examine two types of charitable supporting organizations: "Friends of" Groups (FOGs), which typically emphasize fundraising, and Cooperating Associations (CAs), which typically emphasize visitor support. Across over 300 national park units, we identify their partnership patterns. Recreational parks tend to have neither type of nonprofit partner. Our findings also suggest that FOGs and CAs fill different niches. CAs are drawn to more popular parks or memorials, and FOGs are found in parks with smaller budgets or offering fewer activities. Actor characteristics play a secondary role in explaining nonprofit incidence. The holistic approach of the SES systems perspective demonstrates the importance of connecting resource systems to institutional settings and actor attributes.

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Introduction

Within both the natural resource management literature and the nonprofit literature, a key question is how people work together to provide public goods (be it voluntary fire protection, or conservation of productive fishing ground, etc.). In this study, we examine national parks in the United States to understand why some national parks are able to attract philanthropic support while others are less successful. In doing so, we draw insights from both of these literatures. This article brings together lessons from the nonprofit management literature (which identifies many of the variables used in this analysis) with structure provided by one of Ostrom's later insights, the Social-Ecological Systems (SES) framework (Ostrom, 2007; Ostrom, 2009; McGinnis & Ostrom, 2014). We also match variables identified in the nonprofit management literature to variables in the SES framework, enhancing comparability with other studies in the future.

The purpose of this project is to demonstrate ways that the SES Framework can be used in conjunction with the existing nonprofit literature. Specifically, in this study, we explore the key issue of nonprofit formation by examining what variables in both the SES and the civil society literatures best explain the presence of two types of nonprofts: "Friends of" Groups (FOGs, which typically engage in fundraising and external support activities) and Cooperating Associations (CAs, which typically engage in visitor support and volunteerism). This analysis identifies the extent to which the variables identified in the SES framework are more or less influential than others. In this process, we explicitly draw on lessons about the governance of common-pool resources (Ostrom, 1990) and how situational variables affect the likelihood of cooperation (Poteete et al., 2010).

Philanthropic Support for The National Park Service

For some time, public parks have looked beyond government appropriations for philanthropic and voluntary support. While some efforts reflect public policy shifts (such as the privatization era), they also reflect government responses to fiscal stress (Brudney & Warren, 1990). For example, considerable scholarship about citizen coproduction[i] of public services including parks maintenance was generated from the economic recession of the early 1980s (see for example Brudney & England, 1983). More recently, in 2011, California law was changed to facilitate charitable support for state parks by allowing nonprofit organizations to bypass competitive bidding (Arthur, 2011). Many municipal parks have also formed long-standing private-sector partnerships to generate charitable support, with Chicago's Millennium Park and New York City's Central Park among the more prominent examples.

At the national level, the National Park Service's (NPS) experience offers a particularly noteworthy example of a federal program that has built inter-sectoral philanthropic relationships as its budget has stagnated or declined. According to the Government Accountability Office (Nazzaro, 2006) from 2001 to 2005, total appropriations to the NPS increased at a rate approximately 1% above inflation, but a longer overall trend (NPS, 2009) from 1999 to 2008 shows slight budget decreases. Altogether, the NPS is responsible for 401 park units, representing a budgetary responsibility of $2.98 billion dollars in FY 2012, situated across 84 million acres of land in all U.S. states and territories, and employing approximately 22,000 permanent, temporary and seasonal workers (NPS, 2013).

The National Park Foundation (NPF) serves as the "official charity of America's National Parks" and a source of nearly $20 million in cash and in-kind support in 2011 (NPF, 2013). One of the newest National Park sites, the Flight 93 National Memorial in Somerset, Pennsylvania, would not exist without $9 million in private support from the NPF. As part of its mission, the NPF makes grants to national

parks, monuments, trails, rivers, preserves, recreation areas, historical battlefields, memorials, libraries, and other sites.

The NPS also actively encourages each individual park sites to create or attract "friends" organizations, whose support can supplement appropriations and user fees (NPS, 2013). Organized as individual 501(c)3 charities, some operate through Cooperative Agreements (CAs) as the interpretive associations for national parks and provide program support funded largely from bookstore and gift shop sales they operate inside parks. Others serve as "Friends of" Groups (FOGs) with broader missions to support their park through membership and volunteer recruitment, external fundraising, and advocacy, in addition to or in lieu of income generation inside parks. These sites vary widely in their experiences attracting philanthropic and voluntary support. Of all national parks, most have CAs but less than half have FOGs.[ii]

Ostrom's Social-Ecological Systems Framework

Citizen support for public service provision has taken many forms over many years (e.g., voluntary fire protection, emergency response, neighborhood beautification, public education), and scholars have developed numerous approaches to explaining its presence. We turn to Ostrom's (2007, 2009) Social-Ecological Systems (SES) framework to help explain why some parks are better at attracting support from the public. While Elinor Ostrom's work is primarily associated with natural resources, the nonprofit literature and Ostrom's research both address the same fundamental question: how do groups of people manage to voluntarily work together to overcome collective action dilemmas, and work together for a larger common good (Crawford & Ostrom, 1995). Thus, Ostrom's fundamental insights have already been applied to topics of relevance to civil society such as childcare (Bushouse, 2011), charitable fundraising (Christensen et al., 2009) and open-sourced projects (Schweik & Kitsing,

2010). Scholars have also observed that Ostrom's work has strong connections to the study of nonprofit governance as a form of collective action (Stone & Ostrower, 2007).

The SES framework itself is grounded in Ostrom's earlier work on the design principles for long-lived institutions and the Institutional Analysis and Design (IAD) framework. Ostrom is perhaps best known for the eight design principles of the multi-layered IAD framework she and her colleagues outlined in the 1990s (e.g., Crawford & Ostrom, 1995; Ostrom et al., 1994). This IAD framework is useful because it "emphasizes the careful consideration of contextual factors. It draws attention to the full range of transaction costs. It contains no normative biases and does not presume *a priori* that one type of institutional arrangement is preferred to another. It also uses a variety of criteria to assess institutional performance." (Imperial & Yandle, 2005, p. 502-3). The SES incorporates Ostrom's more well-known IAD framework, and streamlines it into a comprehensive set of variables researchers can use to explain relationships between human (social) and ecological systems.

In laying the groundwork for the SES framework, Ostrom et al. (2007, p. 15176) warned of the dangers of panaceas or "recommendations that a single governance-system blueprint … should be applied to all environmental problems." Instead of looking for a single over-arching solution, they argued that scholars should seek to systematically understand and diagnose the particulars of each problem they are studying. By using a consistent set of criteria (the SES framework) scholars will be able to "diagnose which deeper-tier variables are relevant to a particular class of problem." (Ostrom et al., 2007, p. 15177). To do this, "one needs to build upon the work of scholars who have undertaken careful, well-documented and theoretically sound" work (Ostrom, 2007, p. 15181). The SES framework offers such a structure, by "building a common vocabulary and a logical linguistic structure that would facilitate communication among scholars all of whom confront the daunting problem of developing a coherent

mode of analysis to apply to complex, nested systems operating at multiple scales." (McGinnis & Ostrom, 2014)

Table 1 summarizes the variables included in the SES, combining Ostrom's original conceptualization (2007, 2009) with a more recent, modified framework (McGinnis & Ostrom 2014). The SES shares the nonprofit scholarship's interest in community-level, organizational-level, and human-level dynamics, but conceptually and analytically this interest is differently framed as a series of related subsystems. The SES envisions that within a particular setting, four subsystems (resource systems, resource units, governance systems, and actors) interact and produce various outcomes which themselves continue to influence the subsystems in an ongoing cycle (Ostrom, 2009). The result is a theoretically grounded comprehensive systems model that incorporates not only the socio-demographic variables most often explored in the social sciences but also key physical and biological characteristics of the natural environment that previous research has shown to be vital to understanding how groups of people interact with natural resources (e.g., Holling et al., 1998; Agrawal, 2001). These characteristics are described as "first tier" variables (settings, related ecosystems, resource systems, governance systems, actors, resource units, interactions, outcomes) illustrated in Figure 1; and "second tier" variables are contained within each first tier.

[Table 1 and Figure 1 here]

The SES framework can be used to more readily identify which variables are broadly similar or different between cases under analysis, allowing studies to be designed in a way that helps explain differences in outcomes (Poteete et al., 2010, p. 234). For example:

> "[A] social scientist may want to hold the resource system and its units constant for a particular study, so these are not different while … trying to understand the impact of diverse rules on user behavior leading to outcomes. An ecologist, on the other hand, might want to hold governance systems and attributes of users relatively constant in choosing cases to study so that differences in the resource systems can be examined without substantial simultaneous interactions with social structure." (Poteete et al., 2010, p. 235)

It is also important to note that no single study could effectively incorporate all variables into its analysis. Instead, researchers draw on earlier work to identify appropriate cases and variables.

As a framework, the SES provides an organizing structure in which to test theories and hypotheses. Poteete et al. (2010, p. 236) observe that "a list of variables is not a theory. The intention of developing the SES framework is to help scholars, officials, and citizens understand the *potential* set of variables and their subvariables that can be important in analyzing diverse theoretical questions related to the governance of resources." Thus, in this study, we are using the SES framework in concert with prior nonprofit research framed by coproduction theories to guide us in the development of our questions and selection of variables.

Applying the SES Framework to Civil Society Questions

Scholars have argued that coproduction's traditional definition as citizen involvement in public service provision through volunteerism should be extended to include the participation of entire nonprofit organizations (Authors, in press; Jetté and Vaillancourt, 2011). Modelling coproductive nonprofit organizational activity requires an understanding of complex community dynamics, since it is driven by

both governmental and community needs as well as community resources (see for example Paarlberg and Gen, 2009).

The advantage of the SES framework is in its ability to analyze systems at different spatial and political levels – from cross-national relationships to very small, localized communities (Ostrom, 2007). Its flexibility also allows researchers to apply a consistent and common set of variables across disciplines – such as the multi-disciplinary field of nonprofit management -- with the objective of enhancing the gathering of research findings across diverse social science fields and accumulating knowledge more rapidly about how to sustain complex systems (Ostrom, 2009, p. 422).

Although the SES is not widely recognized in nonprofit and civil society literature, its systems perspective on organizational behavior is most definitely of broad contemporary interest in the social sciences. A systems perspective offers a holistic strategy for understanding the related dynamics of human and organizational behavior (Von Bertalanffy, 1950). For example, scholars have been actively applying systems views of nonprofit behavior to the context of governance, where board performance can be understood as a function of human behavior and both internal and external organizational capacity, and where a contingent view of board behavior has strong explanatory power (Cornforth, 2011; Miller-Millesen, 2003; Ostrower & Stone, 2010).

From a systems perspective, of particular public policy value is the ability to identify both the external and internal drivers of nonprofit activity. For example, in a study of Sierra Club chapters, Andrews et al. (2010) find variances in chapter performance reflected differences not only in community social capital and other environmental conditions that could generate committed members, but also each chapter's capacity for effective leadership, a strong local network, and successful fundraising. In the context of

public-private partnerships between parks and charities, external drivers might include citizen demand for services while internal drivers might include the organizational and managerial capacity to collaborate. The SES framework is helpful here in its ability to account for both internal capacity as well as external environmental variables such as socio-demographic differences that explain nonprofit formation and growth. For example, scholars have ascribed differences in nonprofit activity to rural/urban differences (Komp et al. 2012), educational attainment (Grønbjerg & Paarlberg, 2001), income (Isham et al., 2006), and amount of social capital (Isham et al., 2006; Paarlberg & Gen, 2009). Determinants of volunteering rely generally on very similar environmental conditions (for a full discussion see Musick & Wilson, 2008).

Thus, the SES framework is well suited to an examination of the collective action that happens in the context of national parks management, where voluntary non-governmental organizations (coded GS2 in Table 1) must work alongside public managers of important natural resources such as parks. The framework offers a structure that also incorporates relational dynamics such as governance systems. For example, Babiak and Thibault (2009) found relational dynamics and processes to be important influences on the strength and health of nonprofit-government partnerships. Such attention to connections across and within systems and the nature of shared governance arrangements is important to understanding the cross-sectoral relationships and volunteer support in the systems. It is within this SES framework that we test whether the presence of charities to support park operations, "friending," is a function of characteristics of the park's resource system and institutional setting as well as the socio-demographic characteristics of park users (that traditional nonprofit formation studies would emphasize).

Research Model

The environment in which this voluntary action occurs reflects substantial variation in local conditions and park characteristics, whose missions and operations are each geographically bound. These geographical variations in governance systems, resource systems, and actors offer an ideal opportunity for a multivariate analysis. A geographically bound, place-based analysis also contributes to our understanding of the drivers of place-based volunteering, where citizens have finite choices about how their labor is used.

One of the immediate challenges we encountered in applying the SES framework is that some of the first-tier variables (Table 1) do not have data available in this context (e.g., A7) or are not relevant to this study (e.g., RU2). But they illustrate the flexibility of the SES framework and its complementarity to the existing nonprofit literature. In addition, many variables are effectively held constant in this study, such as the fact that all parks operate within the United States. Using the SES framework, Poteete et al. (2010, p. 238-9) identify twelve "most frequently identified variables in empirical studies as affecting whether users will self-organize." Table 2 presents the variables used in this study and their relationship to the SES framework. This includes some of Poteete et al.'s key variables, the nonprofit literature, and the variables we use in this study.

[Table 2 here]

The nonprofit literature identifies many of the variables (e.g., demographic drivers of volunteering, mission complexity) used in this analysis. These can be matched with variables in the SES framework to enhance comparability with other studies in the future. Table 2 offers an abbreviated mapping of these relationships. This includes an emphasis on the governance system variables, which is also where our dependent variable resides, and (federal) government investment activities in the park units. Variables

can map into multiple categories, such as the Antiquities Act indicator. Parks created via presidential proclamation under authority derived from this 1906 Act may have qualitatively different use histories where locals often initially resist national park designation (because it limits their access or control). Especially for earlier parks, this suggests different property rights and autonomy issues as well, which would fall under the GS category. As another example, external nonprofit support may substitute for external federal appropriations flowing into parks, and more popular parks may have more "Friends of" groups. (Alternatively, other important factors may be more important in explaining partnership formations.) Taken as a whole, we use the variables in Table 2 to build a model explaining which parks have FOGs or CAs. The possibility that some variables result from Friends groups operating (e.g., influential "friends" also lead to presidential declarations) recommends caution in making causal inferences from these results.

Data

Explaining the variation in nonprofits "friending" national parks, we take each national park unit as the unit of interest. Collecting data on all national park units in the NPS inventory involves all park units – whether they have the name "National Park" in their title or not – but excludes affiliated sites operating under other NPS-administered programs such as National Heritage Corridors.[iii] Assembling the dataset entailed some unavoidable complications because national parks cross numerous administrative boundaries (e.g., state and county lines, census tracts). Variable definitions and descriptive statistics for these data are summarized and mapped to their first-tier variables in Table 4. Note that "DV" denotes the dependent variables found in the Governance System section of the table. This illustrates how the dependent variables are an integral part of the SES.

National Park, Friends of Group and Cooperating Association Characteristics

Data from several sources measure various characteristics of each NPS unit. The NPS Public Use Statistics website, now reorganized as the Integrated Resource Management Applications (IRMA) Portal, provided data on key park attributes like acreage, budget, employees, and visitation. The NPS.gov website lists park units by various themes and activities in each park (for example, Civil War themes, camping activities, and others mentioned in Table 4). Park unit websites and NPS histories available through IRMA provided important background history information on parks, including the year and mechanism of their creation. Founding date refers to the year the park was "set aside" or specially designated, even if it had not yet formally joined the NPS system for whatever reason.[iv] The multivariate analysis reduces the count of 387 park units to 308 U.S. based parks after omitting those temporarily closed, those extending beyond the 50 states (e.g., Virgin Islands), and after accounting for jointly administered parks that do not separately report staffing or budget (e.g., parks in the National Mall, Western Arctic National Parklands).

FOGs and CAs can be found in the directories and membership lists of the National Park Service (2011), the Association of Partners for Public Lands (appl.org), and the National Park Foundation through their Friends Alliance as well as contacting many national parks directly. Though some parks may have more than one such organization, mapping the supporting organizations to each park unit yields the following cross-tabulation:

[Table 3 here]

Surrounding Community Characteristics

Community characteristics derive from the 2007-2011 American Community Survey (ACS) five-year averages provided by the US Census. With park size ranging from 0.02 acres to 13 million acres, park units' relationships with their neighboring community – and what defines that community (especially in

the context of a park mission that is overtly national in its audience) – resists simple approaches. The analysis here begins with the smallest available geographic unit with relevant Census data, the block group,[v] and builds from there. Each park is in one or more block group, while most are in multiple counties, and some are even in multiple states. Accordingly, each park is assigned the demographic characteristics of its immediate surroundings as an aggregation of the characteristics of the block groups it crosses. Several alternative aggregations are explored, including a (population- and area-weighted) mean, median, maximum, and minimum. Although weighted averaging is a conventional approach, the context of voluntarism for national parks suggests the possibility that the tails of the distributions of demographic characteristics may be more relevant. For instance, overall average community income may predict active FOGs, but the income of the wealthiest neighborhood may be a better predictor.

In addition to assigning each park the demographics of its attached block groups, a parallel approach is taken for each park's host counties. This allows exploration of alternative aggregations like a population-weighted mean, a median, and a maximum value. These alternative geographic scales (block group or county) and aggregations (mean or maximum) embed different notions of "community." They also pose a degrees-of-freedom problem, with each demographic characteristic being measurable in numerous plausible ways. The results are sensitive to which construction of "community" is chosen, and not all constructions can be included in the same model. The results presented here are the result of extensive specification searches and reflect the most parsimonious models that also fit the data well. County-level measures of community perform the simplest and best. The conclusion revisits what these results imply about defining parks' "communities."

[Table 4 here]

Data Analysis

An initial examination of the data in Tables 3 and 4 indicates considerable variation exists. Friends of Groups (FOGs) and Cooperating Associations (CAs) are both common but hardly universal – about one eighth of parks have neither. About half of the parks have nature themes and about half have historical themes, and fewer than half feature wildlife-related activities and themes. Parks range widely in age, budget, staffing, and character of surrounding populations. Table 5 shows how this variation is correlated with the presence of FOGs and CAs. T-tests indicate that parks with and without supporting organizations are significantly different across many dimensions and do not predict presence of FOGs and CAs in the same ways. For example, in terms of park acreage (*lnacres*), parks with CAs tend to be much larger than other parks, while parks with FOGs are not significantly larger on average.

[Table 5 here]

Table 5 reveals some important patterns. First, parks with FOGs are more popular, have larger staffs, tend *not* be created via presidential decree (or to be memorials) or managed in a group, and are in wealthier and more populous areas. They are not much different in terms of having nature themes, bigger budgets or more acreage, or in terms of age (of the park or of the surrounding community's infrastructure). Their communities tend to be older and more educated. Second, parks with CAs are much bigger, more natural, more rural (and thus have older parks and were more likely to be designated via the Antiquities Act powers), and are surrounded by poorer and less educated residents. The third column shows results when comparing parks with and without supporting organizations. Across all three groupings of parks, several variables appear statistically unrelated to "friend" status, at least in this simple analysis: racial composition, park budget, and history- and recreation-related parks.

Multinomial logit models (estimated with robust errors) were then estimated to explain which factors are associated with greater likelihoods of having a FOG, a CA, both, or neither. The lefthand columns of Table 6 show results for Model 1 with a more parsimonious set of predictors of having a FOG, a CA, or both (omitted variable is "neither"). The righthand columns provide results for a less restricted model with additional covariates. Individually, many variables are insignificant at the 5% level, but collectively they do possess substantial explanatory power. Even with this limited set of variables describing the parks, their actors, and their governance systems, most variables are significant predictors in at least one of the models.

[Table 6 here]

The strongest indicators of whether of a park has nonprofit support groups involve the content of the resource system itself and the resource units. Nonprofits – both FOGs and CAs – are mobilized to support park missions when the park is less recreation-oriented. Cooperating Associations are particularly drawn to more popular parks or memorials, consistent with their docent services, whereas "Friends of" Groups tend to be found alone in parks offering fewer activities. This connection points to a preservation, rather than use, orientation for FOGs and an orientation away from commercializable recreational activities. Model 2 results clarify how recreation themes, rather than exercise (e.g., skiing, hiking) options, matter while remoteness does not.

Table 6 also reveals that, while higher average incomes are not associated with more FOGs or CAs, an upwardly skewed income distribution does provide actors more likely to engage in FOG activities. But in contrast to studies finding higher education associated with more nonprofit or voluntary activity, community education levels play little role with respect to FOGs or CAs. (Only in predicting "Both",

relative to "None", in Model 2 are *eduyrs* and $eduyrs^2$ jointly significant at the 5% level.) Communities with more children are less likely to host CAs alone or both types of support organizations. Greater surrounding populations and a greater percentage of unemployed both predict the presence of CAs, with or without FOGs, relative to no support organizations – a result consistent with CAs' dependence on available labor supply. Interestingly, *white* is significantly related to the incidence of FOGs, but not the absolute probability of parks having CAs. Newer housing and older parks predict CA formation, with or without FOGs, relative to no supporting organizations. Over time, parks may acquire newer residential development and nonprofit support organizations, especially Cooperating Associations. Model 2 includes other demographic indicators that exhibit little explanatory power (e.g., retirees, veterans and renters).

The park resource size in acreage does not explain nonprofit support organization formation, but more popular parks in terms of numbers of visitors do predict CAs (with or without FOGs) relative to no support organizations. Park governance systems, here characterized by whether its administrative office jointly governs a group of parks, are significantly related to whether a park has both an FOG and a CA or neither. Government resources poured into the park itself, FTEs or budgets on a per visit basis, play a complicated role in explaining FOG and CA formation. Relative to neither supporting organization, government resources are not associated with greater relative probabilities of FOG (alone) formation but CAs (alone or with FOGs) appear drawn to larger budgets. In absolute terms, however, smaller budgets and larger staffs are associated with greater likelihood of FOG (alone) formation, and larger budgets increase the odds of hosting both types of organizations. In a sense, poorer parks and FOGs tend to go together, while richer sets of "friends" organizations and better funded parks go together.

Whether the park was originally created via the president declaring it a national monument and exercising his powers under the Antiquities Act of 1906 does not predict the presence of "friends" groups relative to no groups. Interestingly, the possibility that Antiquities Act parks lack local stakeholder support, and hence the need for presidential rather than congressional designation, manifests clearly in the large difference in the *antiquities* coefficient between the FOG and CA columns (*antiquities* is associated with a lower likelihood of having a FOG alone rather than a CA alone, $p<0.05$ in Model 2). Shifting the *antiquities* dummy variable from 0 to 1 significantly lowers the predicted probability of having only a FOG by 9%, from 11% to 2%). If it is the case that existing FOGs help build support for parks to eventually become officially designated, then it appears that these FOGs achieve national park status through Congress and not through presidential decree.

Table 6 illustrates how not all voluntary supporting organizations in the National Parks Service system are created equal as many of the predictors of CAs are not shared with the FOG model. Cooperating Associations tend to be found in the popular, memorial parks without recreation themes. CAs tend to form in communities with higher unemployment and populations, perhaps staffing those volunteer hours in the park. CAs also tend to be found in parks that have high budgets on a per-visitor basis. Alternatively, FOGs tend to be found in non-recreational parks with few activities, surrounded by high wealth and fewer children. Finally, CAs are much more likely to be found in parks that originated as monuments created by the president.

Discussion and Implications

From an academic perspective, employing the SES Framework was productive because it helped frame variables already found to be important in other civil society studies. When our findings are mapped to the SES first-tier variables, surprising patterns emerge. Across both FOGs and CAs, Actor (A)

characteristics are (on the whole) less likely to be significant and have smaller substantive effects. However, variables for Resource Systems (RS), Resource Units (RU), and Governance Systems (GS) explained the bulk of the variation and frequently had larger substantive effects. Our finding therefore is consistent with a dominant theme in nonprofit scholarship, where organizational behavior is either found too complex to ascribe to any single causal agent (see for example Herman & Renz, 2008), or is determined to be predicted by multiple units of analysis (see Gazley, 2008), or dependent on a range of both internal and external characteristics such as market dynamics, client demand, demographic characteristics of a community, or financial or organizational capacity (see for example Baruch & Ramalho, 2006). Thus, taking a more holistic "systems perspective" allows us to incorporate both the nature of any resource (broadly interpreted) and the institutional setting in which users are acting. Using the SES framework shows the importance of opening our thinking to variables we may not usually contemplate.

The nonprofit FOGs and CAs offer an excellent empirical application of SES to better understanding what conditions foster voluntary organizations forming to support public goals of conservation and education. The empirical setting is rich with variation across park units (as "resource systems") but is conveniently embedded in a larger system that provides useful structure for analysis. The FOGs and CAs as nonprofits conform to certain common legal standards. Moreover, national parks possess some universally common features, such as operating rules, funding sources, and hierarchy. National parks have the same mission and bureaucracy. This enhances the comparability across these otherwise rather different resources. Across hundreds of ostensibly equivalent units in the greater national park system, we can leverage the variation in their local characteristics to explain why some have partner nonprofits and others do not.

The analysis reveals some important distinctions between parks with nonprofit "friends" groups and those lacking them. First and foremost, the parks with FOGs differ greatly from those with CAs. Parks with FOGs or CAs differ from parks without any supporting organizations. FOGs follow preservation-oriented, non-recreational parks located in areas with more very wealthy residents. And the fact that only rarely are presidentially created parks able to attract FOGs rather than CAs suggests that a park's "friends" tend to be local, and presidential monuments lack the backing of local stakeholders.
CAs, on the other hand, are drawn to popular, well-funded historical parks surrounded by abundant labor. There is ample opportunity for CAs to raise funds and provide interpretive services in these memorials and wildlife-themed parks. Likewise, the fact that 95% of presidentially created monuments have CAs is consistent with CAs stepping in to provide visitor center services when the NPS could not, because invoking the Antiquities Act does not necessarily bring funding as Congress often only reluctantly supports AA-created parks (Rettie, 1995).

The divergence between FOGs and CAs is particularly striking in the broader context of the National Park Service mission, history, and politics. The tension between preservation and use was built into the Organic Act of 1916. (The NPS's "purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.") Over the years, the NPS and its units became increasingly urban and faced mounting recreational and consumptive pressures. It also expanded its holdings, often far faster than its budget, and portrays itself in a constant state of funding "crisis". The dual roles of FOGs and CAs identified here fit into these themes. FOGs can advocate for preservation against more commercial pressures while assisting with capital funding shortfalls (Rettie, 1995). Meanwhile CAs can provide services for visitors streaming through their gift shop, especially in parks lacking congressional support.

From the nonprofits' perspective, the results reflect circumstances that better accommodate voluntary solutions to collective action problems. Some parks have more need (e.g., few employees), some have more valuable public goods (e.g., not recreation parks), and some parks have more able volunteers (e.g., very wealthy, unemployed, adults). One of our strongest findings is how important the resource and governance systems are for explaining the ability of volunteer organizations to overcome collective action problems in national parks. Many actor characteristics played no role whatsoever. This finding is consistent with much of Ostrom's work, which emphasized institutional settings and resource characteristics.

Many other actor variables might be included in these models. Measures of immigrant status, alternative ethnicity measures, alternative measures of retirees, and other descriptors of park contents have all been tested. In short, none of them proved consistently significant. For example voter turnout, a common proxy for civic engagement or social capital, was never significant.

The insignificant actor results underscore the challenge of identifying the community of actors engaged with national parks as resource systems. Measuring community characteristics at the neighborhood level or at the county level may be capturing the "wrong" community. As *national* parks, it might well be that variation in local demographics ought not explain much about these supporting organizations. Or aggregate statistics may be too highly aggregated to detect those rare individuals who drive the organizations. Some parks' communities might be very local while others are much larger.

Conclusion

The question of why some national parks have "Friends of" Groups (primarily focused on fundraising) and Cooperating Associations (primarily focused on visitor support and volunteerism) provides an opportunity to examine why some national park units are more successful at attracting philanthropic and volunteer resources to supplement stagnant public funding. We use Ostrom et al.'s SES framework to guide our analysis. Our findings have significant implications from both an academic and applied perspective. The academic implications are discussed above, and focus on the value added by the SES framework and the importance of carefully examining resource characteristics (broadly construed) and institutional setting. In this study, these variables were often more important than the actor variables on which studies of civil society often focus.

The SES Framework provides a structure, or a common language in which research can occur. This is important because this common language enhances communication of results across research communities and increases the chances that cumulative progress can be made across disciplines (McGinnis & Ostrom, 2014). The cross-fertilization of ideas supports a more rapid advance in the development of theory. In addition, the SES Framework can be used to provide guidance or help generate questions that may otherwise be missed in a more narrowly defined field of research. The SES framework encourages researchers to consider variables beyond the characteristics of actors, such as characteristics of the governance system, the complexities introduced by the action situation, and the impact of the social, economic, and political setting. These are variables that are often difficult to quantify for analyses such as this, but qualitative research holds the potential to provide significant insight. We hope that in the future qualitative (e.g., ethnographic or observational) studies can explore the roles of these variables in the not-for-profit sector and will provide the basis for more sophisticated quantitative research based on collected case studies.

Our findings also help parks managers understand where productively they can find voluntary support. Parks with delicate ecosystems or few activities, not recreational areas, in wealthy regions tend to make "Friends." High visitation and ample appropriations help attract both types of supporting organizations. Our findings also suggest that FOGs and CAs fit different niches. FOGs appear to serve as advocates and gift-givers to support the preservation goals of parks as public goods, while CAs offer (and generate funding from) volunteer staffing of visitor centers to enhance parks' educational services.

These findings should be taken with some caution. Results are based on a large-scale statistical, cross-sectional analysis with rather limited scope. We are studying where "friends" groups are found, not their impacts on funding, volunteering, park quality, or other outcomes. But our analysis helps to understand the broad pattern and which major variables appear to be important, and helps guide future qualitative or mixed methods research to provide richer details on the formation of these groups and their dynamics. Care should taken about generalizing beyond this sub-sector. Future work would do well both to broaden the inquiry by applying this approach to nonprofit formation beyond the NPS and also to deepen the investigation by further enriching the measures of nonprofits to include size, longevity, and functions (e.g., content of support agreements) beyond the limited measures used here. Additional application of this SES framework can improve our understanding of coproduction and charitable activities in public parks and other sectors (e.g., libraries, schools, disaster relief).

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Table 1: Variables in Ostrom's SES Framework
(Adapted from Ostrom 2009, McGinnis & Ostrom 2014)

Social, economic, and political settings (S)

S1 Economic Development, S2 Demographic trends, S3 Political Stability
S4 Other Government Systems, S5 Markets, S6 Media Organization, S7 Technology

Resource System (RS)	Governance System (GS)
RS1 Sector (e.g., water, forest, pastures, fish)	GS1 Government Organizations
RS2 Clarity of system boundaries	GS2 Nongovernment organizations
RS3 Size of resource system*	GS3 Network structure
RS4 Human-constructed facilities	GS4 Property Rights system
RS5 Productivity of system*	GS5 Operational-Choice Rules
RS6 Equilibrium properties	GS6 Collective-Choice Rules*
RS7 Predictability of system dynamics*	GS7 Constitutional-Choice Rules
RS8 Storage characteristics	GS8 Monitoring and Sanctioning
RS9 Location	

Resource Units (RU)	*Actors (A)*
RU1 Resource unit mobility*	A1 Number of relevant actors*
RU2 Growth or replacement rate	A2 Socioeconomic attributes
RU3 Interactions among resource units	A3 History or past experiences
RU4 Economic value	A4 Location
RU5 Number of Units	A5 Leadership/entrepreneurship*
RU6 Distinctive characteristics	A6 Norms (trust-reciprocity)/social capital
RU7 Spatial and temporal distribution	A7 Knowledge of SES/mental models*
	A8 Importance of resource (dependence)*
	A9 Technologies Available

Action situations: Interactions (I) → Outcomes (O)

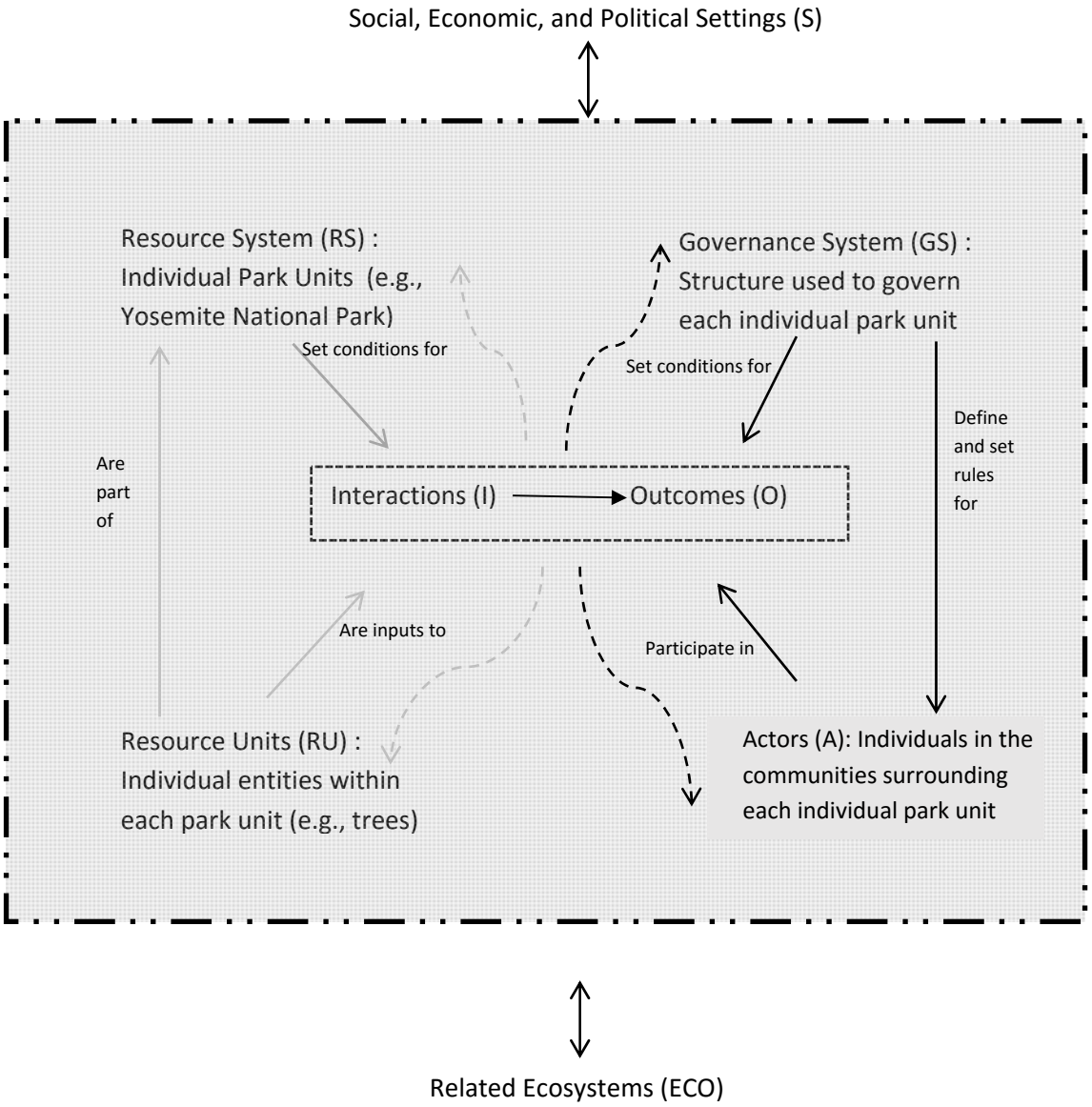
I1 Harvesting	O1 Social performance measures (e.g., efficiency, Equity, accountability, sustainability)
I2 Information Sharing	O2 Ecological performance measures (e.g, over-harvesting, resilience, biodiversity, sustainability)
I3 Deliberation process	O3 Externalities to other SES
I4 Conflicts	
I5 Investment activities	
I6 Lobbying activities	
I7 Self-organizing activities	
I8 Networking activities	
I9 Monitoring activities	
I10 Evaluative activities	

Related Ecosystems(ECO)

ECO1 Climate Patterns, ECO2 Pollution patterns, ECO 3 Flows into and out of focal SES

* Subset of variables found to be associated with self-organization

Figure 1: Visualization of First Tier SES Variables (Ostrom, 2007; McGinnis & Ostrom , 2014) as Applied to the Friending of National Parks



Key:

→ Direct Causal Link

- - - -> Feedback

Table 2: Mapping Study Variables to SES Framework and Nonprofit Literatures

SES Variables	Civil Society Literature Variable	Variable in NPS Friends Analysis
RESOURCE SYSTEM (RS): Individual park units (e.g., Yosemite National Park, Ocmulgee National Monument)		
Size of RS (RS3)*		Acres of park
Human-constructed facilities (RS4)		Type of park (natural, historic, recreation, activities, etc.), ability to track visitors
Productivity of RS (RS5)*	Number of students (Nelson and Gazley, in press)	Number of park visitors
Location (RS9)	Ruralness (Isham et al. 2006)	Distance to nearest hub airport
RESOURCE UNITS (RU): Individual entities within each park unit (e.g., trees, fish, buildings)		
Resource unit mobility (RU1)*		Wildlife themes in the park
Number of units (RU5)*		Number of activities in the park
Actors (A): Individuals in the communities surrounding each individual park unit		
Number of actors (A1)*	City size (Isham et al 2006)	Total population in surrounding counties
Socioeconomic	Retirement and volunteerism (Komp et al.	Population share under age 18,

attributes (A2)*	2012); Wealth (Isham et al. 2006); Community diversity as proxy for citizen demand and Immigration and racial diversity (Paarlberg & Gen 2009).	unemployment, median income, share in top quartile of US income, share white, age of surrounding buildings
History or past experience (A3)	Gazley (2008)	Year park was founded, whether park was created using presidential power in the Antiquities Act of 1906
Norms/Social Capital (A6)*	Educational attainment (Isham et al. 2006); Social capital (Saxton & Benson 2005);	Years of educational attainment, voter turnout
GOVERNANCE SYSTEM (GS): Structure used to govern each individual park unit		
Non-Government organization (GS2)	Nonprofit density studies (e.g., Lecy & Van Slyke 2013)	Presence of FOGs, CAs
Network structure (GS3)		Whether park is administered via a consortium of other units
INTERACTIONS (I):		
Investment activities (I5)	Government spending on social services (Grønbjerg & Paarlberg 2001;), school spending on students (Nelson and Gazley, in press)	Park budget (in dollars per visitor), park FTE employees

Note: Key variables from Poteete et al. 2010 identified by *.

Table 3: Cross-tabulation of national parks with and without supporting organizations

Friends of Groups (FOGs)	Cooperating Associations (CAs)		Total
	Absent	Present	
Absent	49	156	205
Present	33	149	182
Total	82	305	387

Table 4: Definitions and Descriptive Statistics

Variable	Definition	Mean	SD	Min	Max
RESOURCE SYSTEM (RS):					
Park Acreage	ln(park acreage)	7.751	3.793	-3.912	16.394
Memorials	dummy for park classifications containing the word "memorial" (i.e., National Memorials, the Memorial Parkway, or the National Expansion Memorial)	0.049	0.216	0	1
Recreation	dummy for park classifications with the word "recreation" (i.e., National Recreation Area, Scenic and Recreational River, National Recreational River)	0.065	0.247	0	1
History	dummy for historic parks – those NPS associates with the Civil War, heritage areas, historic parks & sites, American presidents, battlefields & military parks, westward expansion, and early explorers	0.565	0.497	0	1
Nature	dummy for nature parks – those NPS associates with caves, coral reefs, endangered species, geysers & hot springs, glaciers, mountains, seashores & lakeshores, volcanoes, wildflowers	0.458	0.499	0	1
Visits	ln(average park visitation, 2008-2012)	12.154	1.732	7.948	16.554

Exercise	dummy for parks featuring biking, climbing, hiking, horseback riding, hunting, skiing, or trails	0.740	0.439	0	1
Airport Distance	ln(distance to nearest hub airport)	11.921	1.317	7.061	14.828
RESOURCE UNITS (RU):					
Wildlife Themes	dummy for living parks – those NPS associates with coral reefs, endangered species, wildflowers	0.357	0.480	0	1
Wildlife Activities	dummy for parks with wildlife activities – those NPS associates with fishing, hunting, and wildlife watching	0.662	0.474	0	1
Activities Count	count of activities that NPS associates with this park	4.036	3.285	0	12
ACTORS (A):					
Population	ln(total population in host counties)	12.522	2.204	7.197	20.384
Kids	mean percentage of population under age 18 in host counties	0.203	0.033	0.026	0.323
Unemployed	mean percentage of population unemployed in host counties	0.084	0.031	0.011	0.220
High Income	mean percentage of population with income over $100,000 per year in host counties	0.192	0.104	0.047	0.547
Household	ln(mean of host counties' median household	10.868	0.295	10.239	11.692

Income	income)				
White	mean percentage of population with race as white in host counties	0.759	0.197	0.155	0.992
Antiquities	dummy indicating whether the President used the Antiquities Act of 1906 originally on the park	0.221	0.415	0	1
Education (Years)	mean of imputed average years of schooling in host counties	13.182	0.691	10.638	14.697
Year Community Built	mean of surrounding neighborhoods' median year built for residences (Block Group level data)	1972.2	14.504	1939	2005
Year Park Founded	year the park was first established, designated or otherwise protected (even if prior to NPS stewardship)	1948.5	32.23	1790	2007
Veterans	mean percentage of adult population who are veterans in host counties	0.110	0.032	0.029	0.213
Seniors	mean percentage of adult population who are seniors in host counties	0.147	0.041	0.057	0.378
Rentals	mean percentage of housing units as rentals in host counties	0.313	0.102	0.132	0.916
GOVERNANCE SYSTEM (GS):					
Friends of Group	parks that have only "Friends of" Groups (Dummy Variable)	0.094	0.292	0	1

Cooperating Agreement	parks that have only Cooperating Associations (Dummy Variable)	0.435	0.496	0	1
Both	parks that have both “Friends of” Groups and Cooperating Associations (Dummy Variable)	0.399	0.491	0	1
Consortium	dummy indicating whether the park is managed by a consortium of parks	0.036	0.186	0	1
INTERACTIONS (I):					
Park Budget	ln(average park operating budget, 2008-2012, per visitor)	-4.502	1.207	-7.863	-0.750
Park Employees	average number of FTEs, 2008-2012	51.212	78.449	0	693.600

Note: N=308. T

Table 5: Comparison of means for National Parks with and without FOGs and CAs

	Parks with FOG		Parks with CA		Parks with FOG and CA		All Parks
Variable	**Mean**	**Sig.**	**Mean**	**Sig.**	**Mean**	**Sig.**	**Mean**
RESOURCE SYSTEM (RS):							
Park Acreage	7.762		8.136	***	8.415	***	7.541
Memorials	0.033	**	0.036	***	0.013	***	0.072
Recreation	0.044		0.056		0.047		0.057
History	0.607		0.564		0.607		0.555
Nature	0.446		0.491	***	0.519	**	0.429
Visits	12.486	***	12.131		12.533	**	12.153
RESOURCE UNITS (RU):							
Wildlife Themes	0.387		0.392	***	0.467	***	0.338
Wildlife Activities	0.685	*	0.670	**	0.733	***	0.625
Activities Count	3.830		3.974	***	4.208	**	3.636
ACTORS (A):							
Population	12.937	**	12.500		12.934	**	12.524
Kids	0.195	*	0.203	**	0.197		0.200
Unemployed	0.085		0.089	*	0.087		0.087
Household Income	10.921	*	10.86	***	0.203		10.890
High Income	0.215	*	0.189	***	10.892		0.201

White	0.733		0.740		0.733		0.732
Antiquities	0.143	***	0.282	***	0.170	*	0.231
Education (Years)	13.311	*	13.155	***	13.235		13.240
Year Community Built	1972.293		1974.214	***	1974.411		1972.641
Year Park Founded	1947.455		1947.652	**	1946.619		1950.175
GOVERNANCE SYSTEM (GS):							
Consortium	0.055	**	0.072	*	0.047	**	0.096
INTERACTIONS							
Park Budget	-4.611		-4.458		-4.563		-4.526
Park Employees	65.237	***	52.658	*	68.143	***	48.274

Significance at the 5%, 1%, 0.1% levels indicated with *,**,***, respectively.

Two-sample t-test for difference in means (unequal means) between group of parks with friends (FOG, CA, or both) and other parks.

Table 6: Determinants of NPS Unit "Friendship"

	Model 1			Model 2		
Variable	**FOG coef. (error)**	**CA coef.**	**Both coef.**	**FOG coef.**	**CA coef.**	**Both coef.**
RESOURCE SYSTEM (RS)						
Park Acreage	0.1907	0.0873	-0.0372	0.2147	0.1309	0.0091
	(0.1930)	(0.1532)	(0.1605)	(0.2222)	(0.1852)	(0.1930)
Memorials	-0.9426	0.4871	-1.1204	-1.6303	0.0343	-1.5250
	(1.1955)	(1.1637)	(1.3263)	(1.2407)	(1.0834)	(1.1931)
Recreation	-14.8216	-1.9341	-3.3615**	-15.8251***	-2.1744*	-3.6233**
	(1.6424)	(1.0404)	(1.2149)	(1.8012)	(1.0968)	(1.2418)
History	1.2543	1.5716**	1.5628**	1.1381	1.5492*	1.5742*
	(0.7354)	(0.5778)	(0.6060)	(0.8157)	(0.6349)	(0.6583)
Nature	-0.4079	0.2906	-1.0233	-0.6960	0.0726	-1.2829
	(1.2528)	(0.9824)	(1.0974)	(1.3610)	(1.0136)	(1.1512)
Visits	0.3057	0.9244*	1.3647**	0.4125	1.1102**	1.5361***
	(0.4417)	(0.3758)	(0.4279)	(0.4875)	(0.3939)	(0.4354)
Exercise				2.1451	1.5265	1.1567
				(1.1601)	(0.9584)	(0.9886)
Airport Distance				-0.1412	-0.0577	0.1095

				(0.5809)	(0.5088)	(0.5317)
RESOURCE UNITS (RU)						
Wildlife Themes	-2.0599	-1.2366	0.3420	-2.2946	-1.5911	-0.0393
	(1.4526)	(1.1206)	(1.2148)	(1.6123)	(1.1316)	(1.2386)
Wildlife	0.8250	-0.7277	0.1976	0.2220	-1.2114	-0.1689
Activities	(0.9646)	(0.7852)	(0.8209)	(1.1061)	(0.9088)	(0.9572)
Activities Count	-0.4794*	0.0713	0.1538	-0.7097*	-0.0471	0.0588
	(0.2396)	(0.1815)	(0.1859)	(0.2867)	(0.1867)	(0.1885)
ACTORS (A)						
Population	0.3881	0.4963*	0.5040*	0.3061	0.4816	0.5242
	(0.2981)	(0.1992)	(0.2081)	(0.4069)	(0.2633)	(0.2737)
Kids	-28.3788*	-15.8044	-25.4799**	-51.8839**	-32.4365*	-44.7869**
	(11.4956)	(8.9830)	(9.2687)	(19.6058)	(16.0441)	(16.7862)
Unemployed	20.5862	28.7954*	31.8781*	16.9507	25.2961	29.3845*
	(21.7310)	(13.8631)	(14.4520)	(21.3058)	(13.9947)	(14.5716)
High Income	25.5875*	-0.0258	13.0325	19.5747	-8.4418	4.6118
	(11.6989)	(7.8269)	(8.1784)	(12.3385)	(9.3101)	(9.2581)
Household	-9.3312	-2.8326	-6.2021	-8.8183	-0.9674	-4.3117
Income	(4.7786)	(3.2764)	(3.3853)	(4.9177)	(3.4041)	(3.4264)
White	7.0454**	4.0458*	3.6568	9.4013**	5.0595*	5.0864*
	(2.3581)	(1.9095)	(1.9547)	(2.9172)	(2.3761)	(2.3685)
Antiquities	-1.9742	0.9392	-0.1997	-2.1987	0.7762	-0.3758
	(1.9773)	(1.4654)	(1.5035)	(1.7900)	(1.4231)	(1.4729)

Education (Years)	25.1560 (24.7000)	4.3740 (8.5823)	16.0142 (9.1283)	24.9283 (25.5770)	4.8647 (9.0414)	18.7939 (9.9342)
Education (Years) Squared	-0.9181 (0.9152)	-0.1398 (0.3379)	-0.5910 (0.3545)	-0.8982 (0.9462)	-0.1504 (0.3564)	-0.6852 (0.3850)
Year Community Built	0.0417 (0.0248)	0.0728*** (0.0215)	0.0917*** (0.0220)	0.0372 (0.0267)	0.0733*** (0.0217)	0.0951*** (0.0225)
Year Park Founded	-0.0384 (0.0199)	-0.0420* (0.0187)	-0.0468* (0.0189)	-0.0378 (0.0214)	-0.0424* (0.0200)	-0.0491* (0.0204)
Veterans				-11.6640 (17.1237)	-18.6287 (14.8566)	-28.0343 (14.6763)
Seniors				-33.0651 (20.2238)	-17.6502 (14.6425)	-18.4581 (14.5012)
Rentals				-4.0437 (5.9459)	-3.7302 (4.0998)	-4.6684 (4.2957)
GOVERNANCE SYSTEM (GS)						
Consortium	-0.1698 (1.4827)	-2.3643 (1.2957)	-2.4417* (1.2202)	-0.5453 (1.4789)	-2.7750* (1.3506)	-3.0262* (1.2796)
INTERACTIONS						
Park Budget	0.3593 (0.5823)	1.9845*** (0.5217)	2.4402*** (0.5569)	0.6102 (0.6574)	2.3340*** (0.5599)	2.7662*** (0.5880)
Park Employees	0.0141 (0.0173)	-0.0015 (0.0171)	0.0001 (0.0171)	0.0187 (0.0181)	0.0007 (0.0174)	0.0018 (0.0174)

Constant	-89.8355 (174.5080)	-72.1182 (76.2965)	-141.8118 (79.1449)	-73.8882 (184.0122)	-86.8217 (74.1968)	-175.1995* (81.4086)
N, LR (df)	308	204.693 (69)		308	214.121 (84)	
Pseudo-R^2 , AIC, BIC	0.2916	2.082	-854.982	0.3050	2.149	-778.460

Significance at the 5%, 1%, 0.1% levels indicated with *,**,***, respectively.

The superscript ^{BG} is a reminder that this is measured from block-group-level data.

ENDNOTES

[i] Coproduction describes situations in which the users of a public service participate in its creation and/or delivery, such as through voluntary labor.

[ii] "The fundamental differences between Friends Groups and Cooperating Associations are the focus of their mission and the source of their income. Friends Groups generally have a mission to provide support for the overall mission of the park partner. Funds to support their work comes from donations/fundraising, membership, special events, and perhaps from earned income generated through sales through on-line or other off-site (i.e., not in the park) venues. Cooperating Associations have a very specific mission focus to provide program and financial support to the NPS in the areas of education, interpretation, and research. The income to support these activities is generated in large part from the sale of interpretive and educational items in park visitor center bookstores. Only Cooperating Associations may operate these facilities." (National Park Service, 2009, p.6)

[iii] The classification of national parks as "National Parks" or "National Memorials" or any of more than a dozen other designations carries few statutory distinctions. They all possess identical legal standing, although National Preserves allow for consumptive (e.g., hunting, mining) activities not typically allowed elsewhere.

[iv] Reasons include predating the NPS (e.g., Yellowstone) or initially being managed by a different agency. Results change minimally when year-of-acquisition is used instead.

[v] Roughly speaking, a block group averages in population around 4,000 people and is drawn with local input to match local perceptions of neighborhood when possible.